

Publication
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Cream dispenser

Description

The invention relates to a cream dispenser according to the characterising part of claim 1.

From a dispenser for a creamy mass according to PCT/EP/01475 a device is known where the movement of a side push-button is converted into a movement of a delivery plunger at right angles thereto. The resources necessary for this are expensive in terms of the number and form of the individual parts and their assembly.

The task of the invention is to create a cream dispenser in such a way that the expenditure for individual parts and assembly and subsequently the production costs are kept to a minimum, without impairing its function. In particular, the function should not lead to impairment of the delivery process as a result of unwanted air pockets in the mass to be filled. In addition, it is ensured that when the cream is applied no bacteria or pathogens can be transmitted from the user's finger to the cream content, making it unusable as a result of bacterial or chemical changes. This could also trigger allergic reactions. This means that creams without preservative additives can be used.

This task is solved by the invention stated in claim 1.

The sub-claims are advantageous developments of the generic cream dispenser.

A useful and particularly simple design can be seen in Fig. 1.

The plunger connected axially to the push-button leads directly into the pumping chamber, without the need for any further transmission elements; the isolation of the plunger from the pumping chamber and the cylinder guide from which the push-button protrudes, only requires a seal which can also be fixed without additional means. It is pressed by a compression spring, which is in any case required for the return of the push-button and the plunger, against a ring surface in the valve housing (Fig. 1, 2). Another useful embodiment of the seal of the plunger is shown in Fig. 3. In this version, by means of a groove at the end of the plunger a seal in the type of a lip packing is engaged in the groove. To ensure that the seal lips, which are sensitive to mechanical damage, are not damaged, there is a lug on the groove, the conical shape of which facilitates the extension and engagement of the seal into the groove. Also the length of the lug is designed in such a way that the outlet valve projecting into the pumping chamber does

not collide with the plunger in the end position (fig. 2) or with the seal on the plunger (fig. 3).

A further useful arrangement of the compression spring provided for the recovery of the push-button can be seen in fig. 4. Here a compression spring with a smaller diameter than that previously described is threaded through two pins lying opposite each other between the plunger and the front wall of the pumping chamber. These pins centre this compression spring both in the plunger and on the front wall of the pumping chamber, and also clamp the compression spring at both ends as a result of the conical shape of the pins. The advantageous aspect here is that no additional measures are required to delineate the non-activated end position of the push-button, because in the relaxed state the compression spring prevents the plunger and the push-button from returning any further. Thus no limit stop for the push-button, as in Fig. 1-3, is necessary which in terms of production technology represents an undercut which has to be overcome during assembly of the push-button. It is advantageous that the outlet valve is housed not centrically but near to the edge of the preferably round top of the dispenser head. This means that when the dispenser is used, only part of the top of the dispenser head is unintentionally wetted with cream. Also the central axes of the pumping chamber and the outlet valve intersect, which makes it possible for the cream to be extracted directly from the pumping chamber.

It is useful that the disc of the outlet valve in the closed position forms a common scraping surface with the top of the dispenser head. This achieves a high swab effect.

An advantageous embodiment of the one-piece outlet valve consists of segments being created by longitudinal slots of the valve body, which are elastic transversally to the axial direction, which means that the nipples at the end of the segments can hook and engage during assembly, i.e. when pushed through the valve bore.

Another useful embodiment of the outlet valve consists of the closing process of the valve body being supported not only by under-pressure but also by elastic force.

5 examples are explained on the basis of the enclosed drawings.

They show :

Fig. 1 Overall cross-section, non-activated

Fig. 2 Cross-section through the dispenser head with housing seal and outlet valve in one piece.

Fig. 3 Cross-section as above, but with piston seal.

Fig. 4 Cross-section as above, but with compression spring in the pumping chamber.

Fig. 5 Cross-section as in fig. 2, but outlet valve on same axis as pumping chamber.

Fig. 6 Outlet valve, in one piece, side view

Fig. 7 Outlet valve, in one piece, plan view

Fig. 8 Outlet valve, spring-loaded, with leaf spring.

Fig. 9 as fig. 8, but plan view

Fig. 10 Leaf spring, plan view

Fig. 11 Leaf spring, side view

- Fig. 12 Valve body, side view
- Fig. 13 Valve body, plan view
- Fig. 14 Outlet valve, cross-section with bar spring
- Fig. 15 as fig. 14, but plan view
- Fig. 16 Outlet valve, spring-loaded with compression spring
- Fig. 17 as before, but plan view

The cream dispenser (Fig. 1) consists of a dispenser head 1 and a container 2 which can be screwed on to it, which can also be regarded as a replaceable cartridge. The dispenser head 1 of the cream dispenser designed as a standing device contains a dispensing mechanism which consists of a plunger 3, connected to a push-button 4 which can be moved sideways. The path of the plunger 3 which serves to dispense portions of product is limited by a front face 5 at the end of the plunger 3 hitting a front wall 6 of a pumping chamber 7. By means of a compression spring 8 which lies between the push-button 4 on one side and a seal 9 on the other side, the plunger 3 and the push-button 4 are returned to the starting position. Their starting position is delineated by a limit stop 10 which is arranged around a cylinder guide 11 in the form of nipples. The position of the seal 9 is determined by a ring surface 12 in the dispenser head 1. The seal 9 tightly surrounds the plunger 3 and also seals off the working area of the push-button 4. An outlet valve 13 with an outlet opening orientated perpendicularly to the operating axis is arranged eccentrically to the centre axis of the preferably circular dispenser head 1 and can be inserted as a separate unit in the dispenser head 1. The outlet valve 13 consists of a valve housing 14, a valve body 15 which can be moved longitudinally, with a disc 16 and a valve seating 11. A spring element, in the form of a leaf spring 19 (Figs. 8-13) is riveted on the valve body 15 with a centring 20 and lies under preload on an edge 21 of the valve housing 14 (fig. 8). A channel 22 in the dispenser head 1 forms the connection between the container 1 and the pumping chamber 7 when the plunger 3 is in the starting position. The diameter of the pumping chamber 7 and the plunger 3 is designed in its sliding fit in such a way that wetting of the wall with cream forms a seal which, when the plunger 3 is returned by the compression spring 8, creates sufficient suction in the pumping chamber 7 to guarantee cream being sucked out of the container 2 through the channel 22 and also to overcome the friction of the follow-on piston 23 on the inner wall of the container 2. The spring-loaded outlet valve 13 serves as a further guarantee of sufficient negative inlet pressure.

Fig. 2 shows a dispenser head 1 with a simplified outlet valve 27 which has segments 28 which are elastic transversally to the axial direction, the nipples 29 on which delineate the opening path of the valve body. By simple snap-on assembly, the one-piece outlet valve 27 is engaged securely in the valve bore of the dispenser head 1.

In Fig. 3 a seal 24 fixed longitudinally in a groove 25 at the end of the plunger 3 is used. A lug 26 serves as limit stop against the front wall 6 and prevents the seal 24 from entering the area of the outlet valve 27, which could interfere with the latter's operation and could damage the seal 24. In Fig. 4 there is a compression spring 30, which is fixed on one side in a plunger 31 and on the other side on the front wall 6 of the pumping chamber 7, in each case in a pin 32 placed centrically to the plunger 31. This removes the need for the limit stop 10 in the form of nipples for limiting the backwards displacement

of the push-button 4 (fig. 1). This avoids the critical demoulding of nipples in the injection moulding process.

A space-saving seal 24 in the form of an O-ring seals the plunger 31 off from the pumping chamber 7.

The front end position of the plunger 31 is limited by the front sides of the pins 32 and 32'.

A variant of the outlet valve according to fig. 8-13 can be seen in figs. 14 and 15. In this case the leaf spring 19 described above is in the form of a bar spring 33 and is inserted in a groove 34 and riveted by ultrasound for example. The outlet valves 13' and 13'' shown in figs. 14 and 16 are intended for predominantly horizontal installation according to fig. 5.

Key

- 1 Dispenser head
- 2 Container
- 3/3' Plunger
- 4 Push-button
- 5/5' Front face
- 6/6' Front wall
- 7 Pumping chamber
- 8 Compression spring
- 9 Seal
- 10 Limit stop
- 11 Cylinder guide
- 12 Ring surface
- 13/13'/13'' Outlet valve
- 14 valve housing
- 15/15' Valve body
- 16 Disc
- 17 Valve seating
- 18 Spring element
- 19 Leaf spring
- 20 Centring
- 21 Edge
- 22 Channel
- 23 Follow-on piston
- 24/24' Seal
- 25 Groove
- 26 Lug
- 27 Outlet valve
- 28 Segment
- 29 Nipples
- 30 Compression spring

31 Plunger
32/32' Pins
33 Bar spring
34 Groove
35/35'/35'' Valve housing
36 Support
37 Compression spring

Patent claims

1. Cream dispenser with a dispenser head (1) and a side push-button (4) to activate a plunger (3) and an outlet valve (13) and that the dispenser head (1) is connected detachably to a container (2) and has a follow-on piston (23), characterised in that the push-button (4) when not operated comes to rest against a limit stop (10) by means of a compression spring (8) and that the plunger (3) is attached on the same axis to the push-button (4) and a seal (9) seals a pumping chamber (7) off from a cylinder guide (11) on the plunger (3), which releases a channel (22), and when the push-button is operated, covers the channel, and that a disc (16) of the valve body (15) comes to rest against a valve seating (17) by means of a spring element (18).
2. Cream dispenser according to claim 1, characterised in that the seal (9) surrounding the plunger (3) comes to rest on a ring surface (12) of the dispenser head (1) by means of the compression spring (8) (figs. 1 and 2).
3. Cream dispenser according to claim 1, characterised in that a plunger (31) has a groove (25) into which a seal (25) can be engaged (Fig. 3).
4. Cream dispenser according to claims 1 and 3, characterised in that there is a conical lug (25) on the groove (25), which limits the displacement of the plunger (31) on the front wall (6) (Fig. 3).
5. Cream dispenser according to claim 1, characterised in that the compression spring (8) can be supported on one side on the push-button and on the other side on the ring surface (12) (Fig. 3).
6. Cream dispenser according to claim 1, characterised in that a compression spring (30) is held between a plunger (31) and a front wall (6') and that 2 conical pins (32) in the plunger (31) and on the front wall (6') fix the two ends of the compression spring (30) at their internal diameter by clamping (Fig. 4).
7. Cream dispenser according to claims 1 and 6, characterised in that the displacement of the plunger (31) can be limited on the front faces of the conical pins (32) (Fig. 4).
8. Cream dispenser according to claims 1-7, characterised in that the outlet valve (13) is located eccentrically to the midpoint of the round dispenser head (1) and perpendicularly to the axis of the plunger (3, 31) (Figs. 1-4).

9. Cream dispenser according to claims 1-8, characterised in that a disc (16) of the outlet valve (13, 27) in the closed state forms a common scraping surface with the top of the dispenser head (1) (Fig. 1-4).

10. Cream dispenser according to claims 1 and 9, characterised in that an outlet valve (27) has segments (28) which are elastic transversally to the longitudinal axis, at the ends of which nipples (29) serve as a limit stop to restrict the open position and as security.

11. Cream dispenser according to claims 1 and 9, characterised in that the outlet valve (13) has a valve body (15) which receives a leaf spring (19) at a centring (20) which comes to rest elastically at one edge (21) of a valve housing (14) (Fig. 18).

12. Cream dispenser according to claims 1 and 9, characterised in that the outlet valve (13') has a valve body (15') which receives a bar spring (33) in a groove (34) (Fig. 14, 15).

13. Cream dispenser according to claims 1 and 9, characterised in that the disc (16) of a valve body (15'') comes to rest on the valve seating (16) by means of a compression spring (37) fixed between a valve housing (35') and a support (36).

14. Cream dispenser according to claims 1, 12 and 13, characterised in that the arrangement according to Figs. 14-17 can predominantly be used for horizontal installation according to figs. 5 and 6.

15. Cream dispenser according to claim 1, characterised in that the container (2) can be in the form of a replaceable cartridge.

5 pages of drawings.

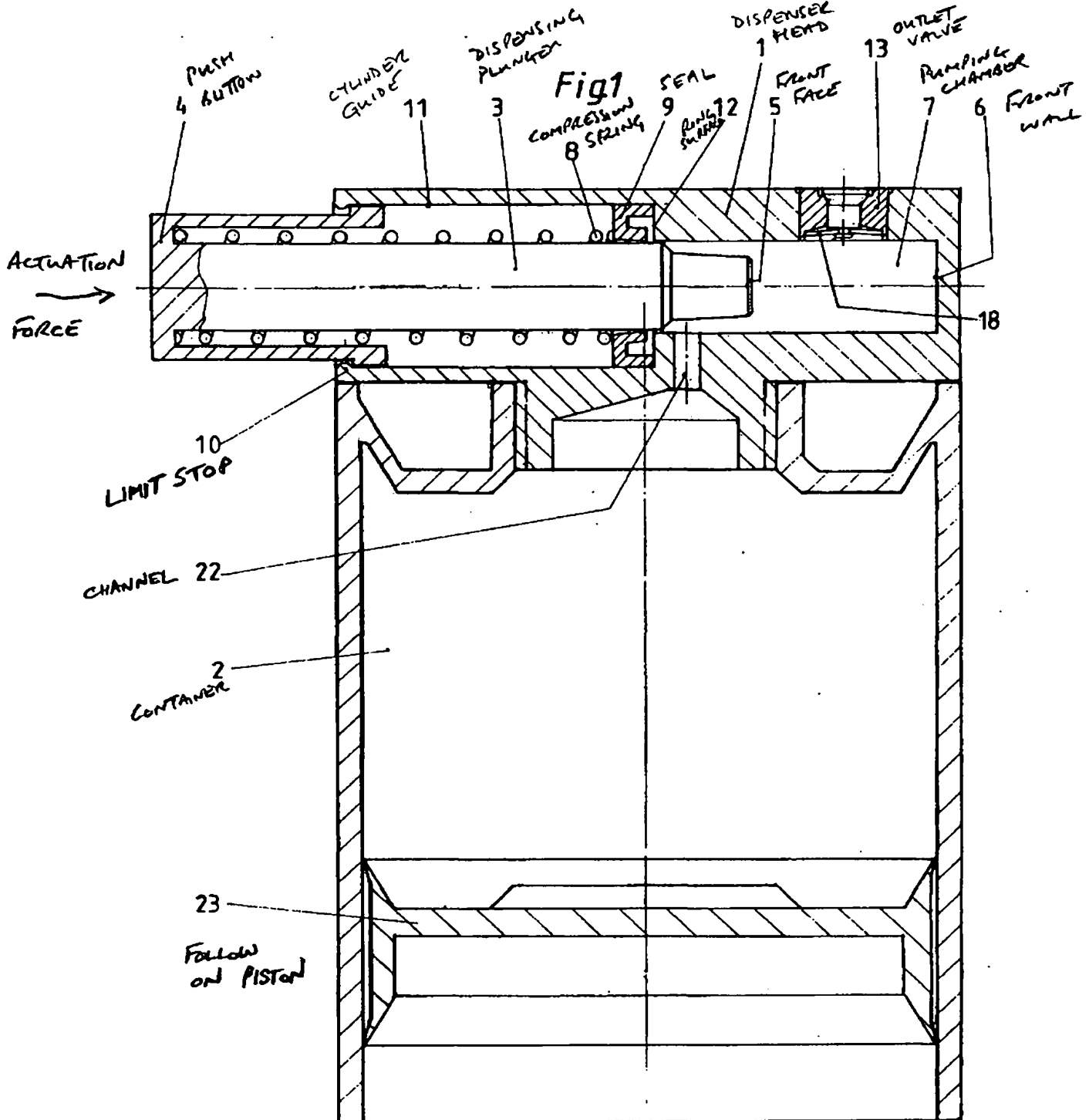


Fig.2

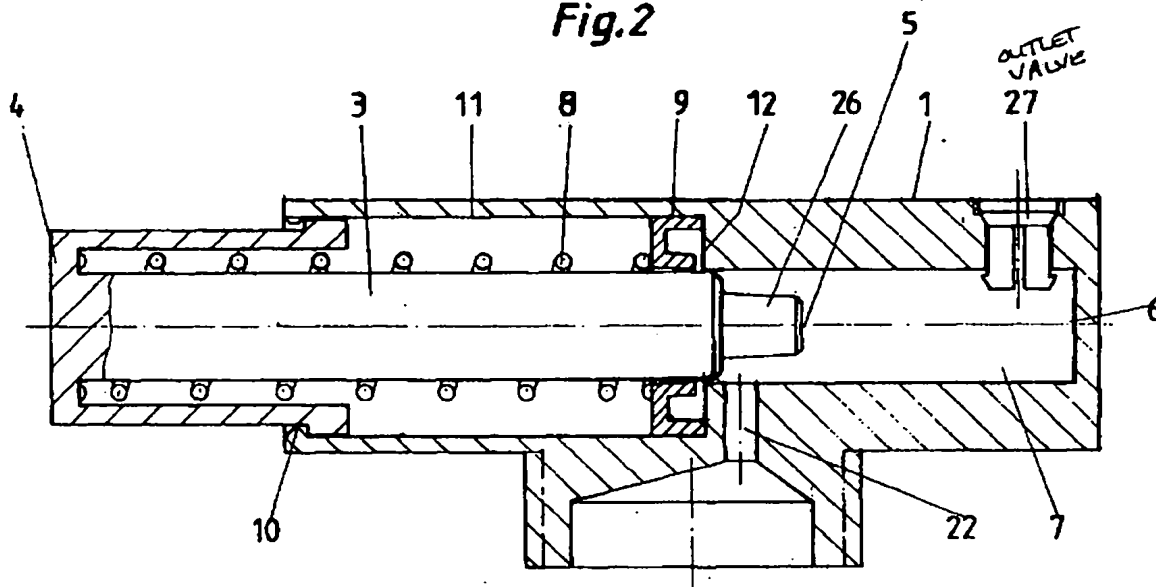
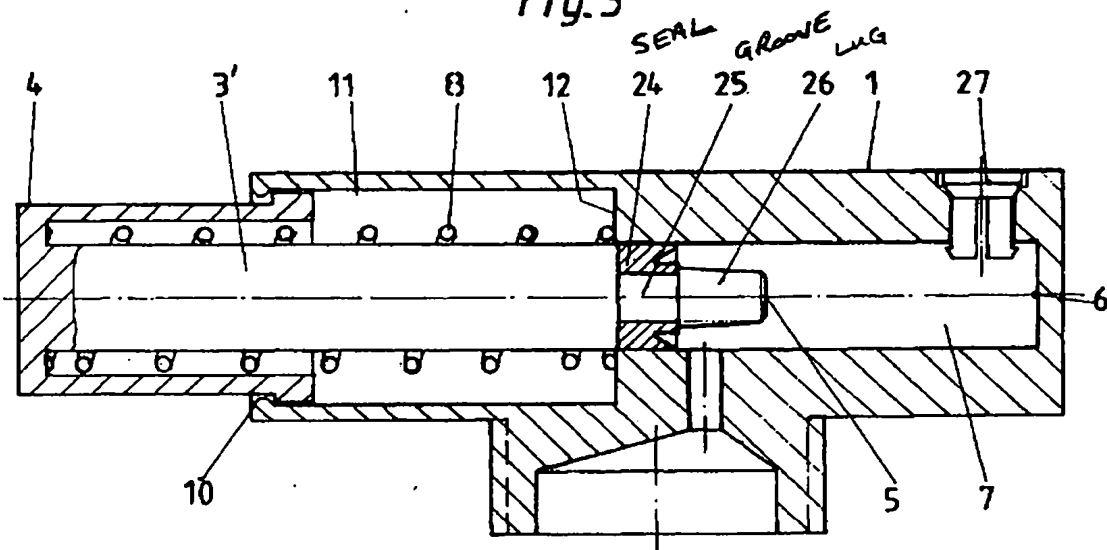


Fig.3



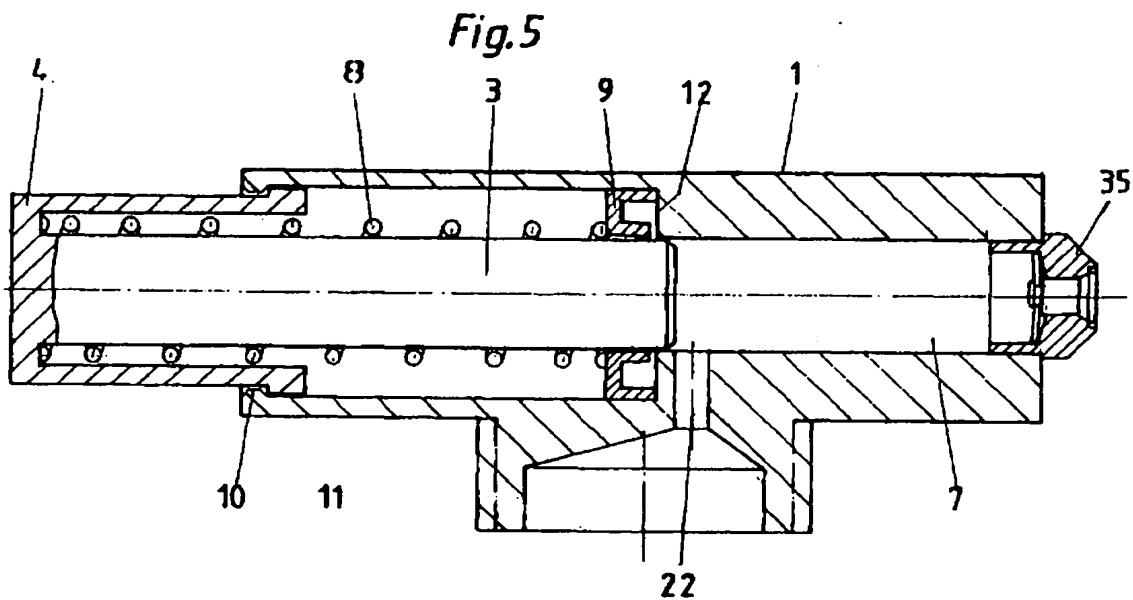
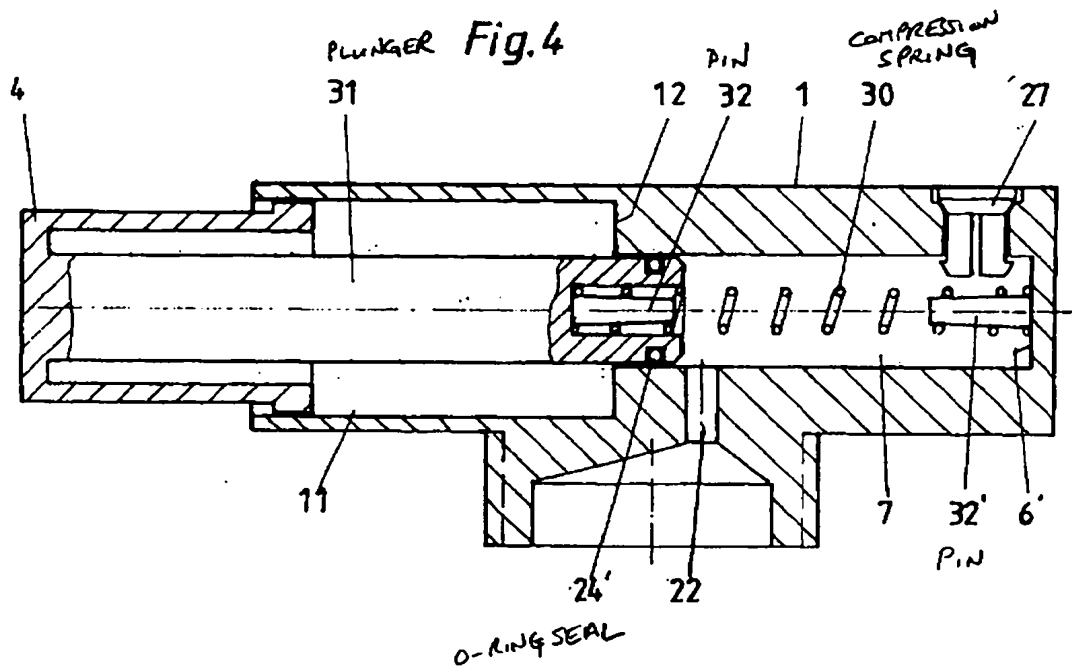


Fig.6

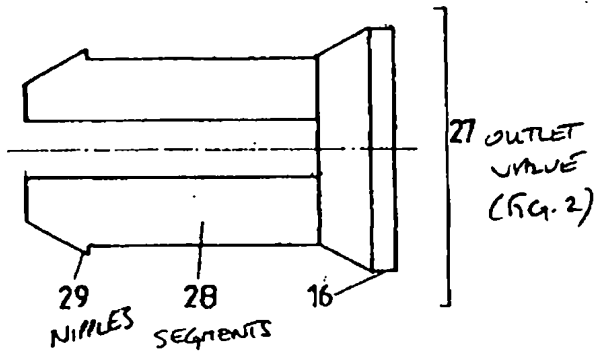


Fig.7

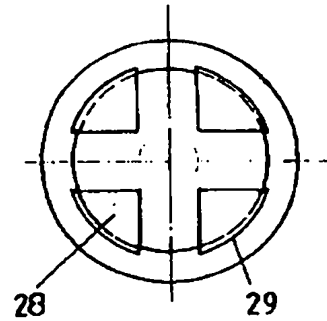


Fig.8

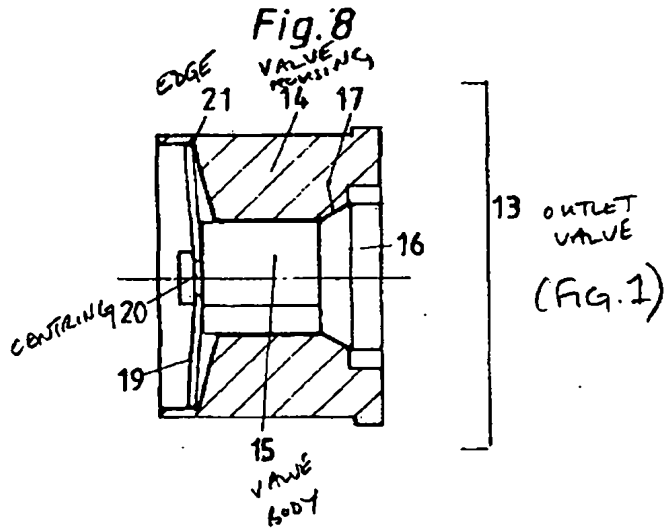


Fig.9

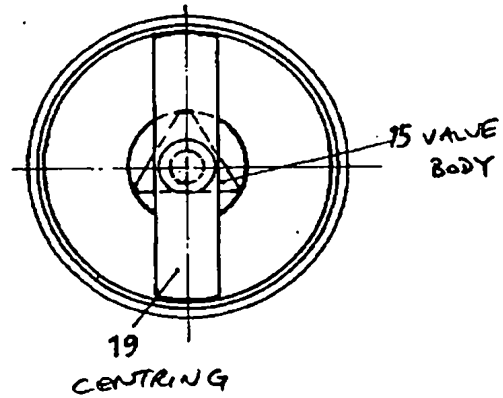


Fig.10

Fig.11

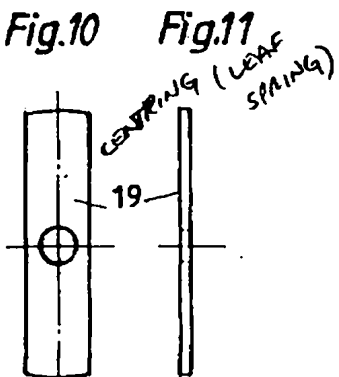


Fig.12

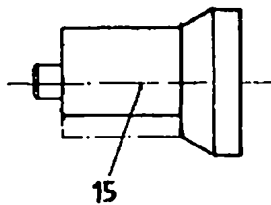


Fig.13

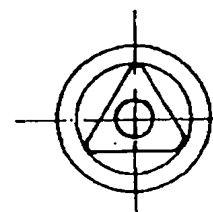


Fig.14

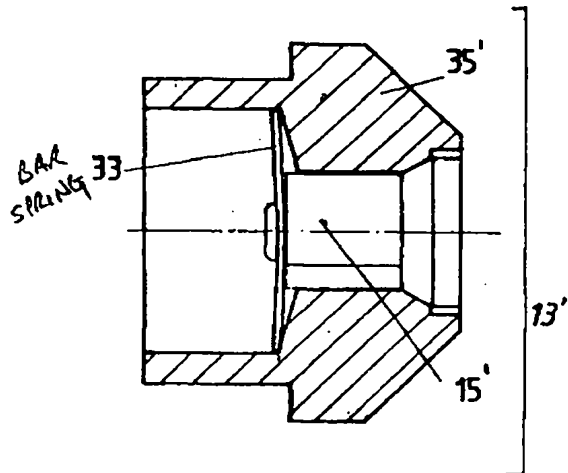


Fig.15

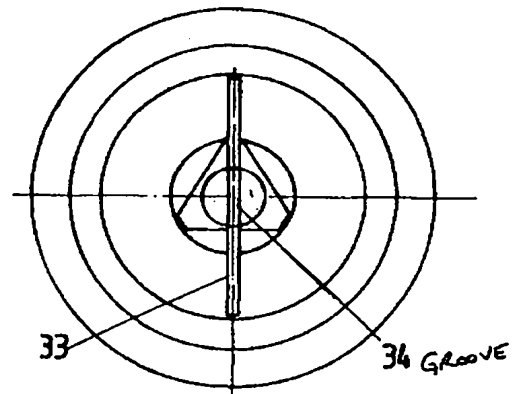


Fig. 5

Fig.16

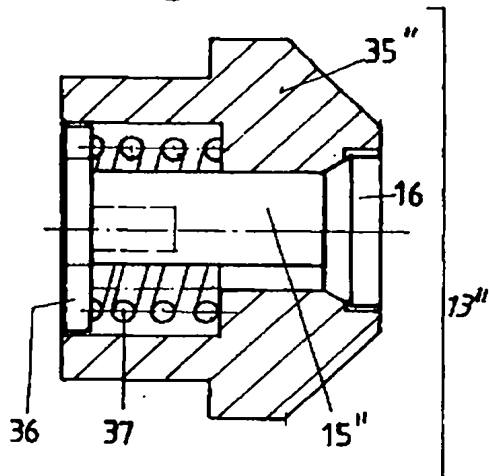


Fig.17

